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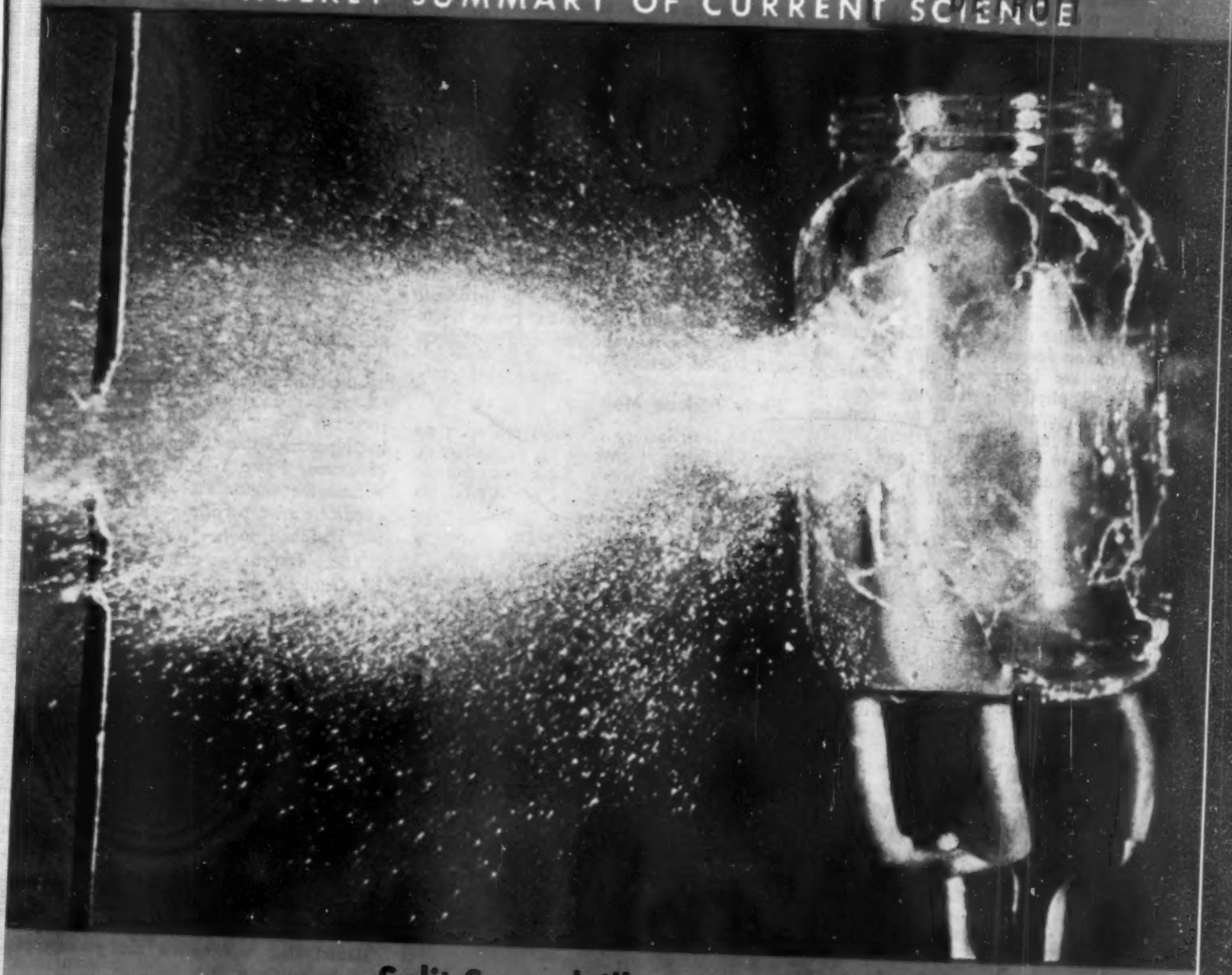
DECEMBER 31, 1949

INDEX

SCIENCE NEWS LETTER

THE WEEKLY SUMMARY OF CURRENT SCIENCE



Split-Second Illumination

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GENERAL SCIENCE

Next Year in Science

Factory duplication of the method of photosynthesis and the solution of the structure of the atom's heart are major mysteries which may be top science advances of 1950.

By WATSON DAVIS

➤ TWO major mysteries of nature may be solved in 1950, bringing new energy to the world compatible with the great spurt of atomic progress that followed the fission of uranium in 1939.

Scientists hope to discover the way in which the green leaf captures the energy of the sunshine and turns it into sugar and starch that feeds and fuels the world. If the method of photosynthesis is discovered and if it is duplicated practically for factory use, it will be a great advance. This may happen within the year. Intensive efforts are being made.

Atom's Heart Probed

How the heart of the atom is put together and what holds it together is still unknown. Because discovery of the nature of these "meson forces" is so important, cosmic rays are being studied extensively. Theoretical physics is receiving more attention than ever before. If new concepts are obtained and applied experimentally, it may lead to new kinds of atomic bombs and useful energy from materials more plentiful than uranium. Is this on the 1950 calendar?

These are long shots for 1950. Here are more sure predictions:

Following the reported 1949 successes of the steroid compounds, cortisone and ACTH, in treating rheumatic arthritis and other similar diseases, there will be great effort made to find other similar materials. Increased production of these scarce hormones will be obtained through use of more plentiful raw materials.

There is a possibility that adrenal glands from animals may be kept alive outside the body. Treated with precursor substances that can produce the adrenal cortex hormones, they may be made to produce the active steroid hormones useful in treatment.

Exploration of the effect of these hormones will probably show that they are connected not alone with arthritis and possibly cancer, but with mental disorders. It probably will be found that if a sufferer from schizophrenia responds to adrenal hormone treatment, there are possibilities of good effects from electroshock.

Mental Disease Prevention

Increasing attention will be given to the treatment and prevention of mental disease, with an accent upon the training of psychiatrists and equipping of general practitioners and hospital attendants with knowledge of psychiatry.

New antibiotics, some of them effective against diseases not yet reached by this class of disease fighters, will be found. New discoveries in biological substances in plants and animals will probably be made, some of them of use in disease treatment. In the case of viruses, it is expected that it will be possible to produce permanent changes in them so that these mutations of these substances can be used for eventual treatment of disease.

To man's control of nature on farm and in field, chemicals will give continued aid. The usefulness and limitation of such substances in insect control as DDT and 2,4-D in weed killing will be worked out further. New varieties of plants and animals, produced genetically and by breeding, will be introduced. Look for better range grasses for use in the semi-arid southwestern United States.

Early African Man

The long history of man's evolution on earth is being discovered with accelerating pace. From Africa there are due during the coming year new finds of ancient human forms. These are likely to approach more closely than any others the "missing link" that was talked about in Darwin's day.

The exact dating of ancient human remains has been difficult in the past. Investigations of radioactive materials, stimulated by atomic energy researches, promise to make the accurate determination of the age of such skeletons simple and more definite. To the dating of all geological material through the eons of the age of the earth, radioactivity will give more precision in the months to come.

The conquest of space will continue with great urgency because the world is preparing for war in the stratosphere. Rockets, jet planes and guided missiles of every possible sort will make trial flights, but most of them will be secret so far as public announcement is concerned.

Artificial Moon

Man's power may succeed in flinging into outer space an object outside the practical gravitational influence of the earth. The first of the earth's artificial moons, or satellites, may be placed in an orbit, a forerunner to such machines that can be used for science and even possibly for war. This is an extreme possibility for 1950, but some government may be at work on it with great secrecy.

For more conventional aircraft, most of the progress will be improved performance of planes now in existence and continued research and progress in aeronautical design so necessary to keep up with the rest of the world.

Giant electronic "brains" will begin to figure more in research for 1950 as they get into more extensive use. These electronic computers will be used for complex mathematical handling of information that would be hopelessly obsolete if subjected to ordinary methods of computing. For instance, special electronic computers are likely to begin to receive radar information about an incoming plane or rocket and use it in such a way as to determine and set automatically the path of a guided missile that will intercept it.

Atom Smashers

The other kind of complex machines, atom smashers of various sizes and uses, will be hard at work in 1950. Will there be found through their use the negative proton for which physics has a place due to our human belief in the balance of nature (since there is a positive electron)? Or will there be found new kinds of mesons? These are powerful but brief-lived particles that are part of the nuclei of atoms. There is still a great frontier within the atom. Perhaps the neutrino, another elusive particle required by theory, will be found, too.

There is prospect of eventual discovery of chemical elements beyond number 96, now the heaviest known. The new elements will all be artificial, highly radioactive and short-lived and the chemists may not get around to discovering and isolating them in 1950.

Star Evolution

How the stars have evolved will be better understood as the result of work at Lick Observatory in California that will be made known during the year. Relationships between the color and the candlepower of stars will be developed that will modify astronomical theories. A new telescope will go into service at Harvard's South African station that will enrich the photographs of the southern skies.

The 1950 census will give new information about the human population of not only the United States, but the whole western hemisphere because most of the other parts of the two continents will be joining in this decennial nose-counting.

GENETICS

Sex Organs Rejuvenate

Worn-out ovaries are rejuvenated when transplanted to young dogs. It is thought that this rejuvenation will also occur in transplantation of human ovaries.

➤ THE possibility that a woman could give birth to her grandmother's children was raised when a bewildered little mongrel gave birth this year to two sets of thoroughbred cocker spaniel puppies.

The cocker spaniel puppies were born after veterinarian Dr. Leon F. Whitney of Orange, Conn. had transplanted one ovary, the female sex gland, from a female cocker spaniel to Brownie and then bred the mongrel to a male cocker.

Brownie's strange motherhood was the culmination of a series of transplantations with other dogs in which Dr. Whitney discovered for the first time that worn-out ovaries from old dogs became rejuvenated when transplanted to young dogs.

Dr. Whitney worked with Dr. Harry S. N. Greene, professor of pathology at Yale University School of Medicine, New Haven, Conn. Dr. Greene declared that he saw no reason why ovaries could not be transplanted between human females. He added that, although it hasn't been tried yet, there is no reason why an old human ovary would not become rejuvenated when transplanted into a young woman.

Dr. Whitney's experiments have not yet gone on long enough to permit him to perform a second transplantation of the cocker's ovary now inside Brownie. However, he plans to make another transplantation when Brownie gets old. "If that succeeds," he says, "it will open up a whole new field of animal genetics."

Dr. Greene confirmed Dr. Whitney's work as completely valid and declared that it represented "a revolution."

Both were thinking of the possibilities in the cattle and livestock industries. Scientists have shown that fertilized eggs can be transplanted from one cow to another, opening the way for pedigreed, pure-blooded calves to be born of scrub-foster mothers. But if the ovaries of cows can be transplanted, and if they are rejuvenated as those of Dr. Whitney's dogs have been, it would be possible for a champion pedigreed cow to have calves years after she herself is dead. Dr. Whitney says he'll try transplantation in cattle in 1950.

Neither Dr. Whitney nor Dr. Greene have thought much about the possibilities of the same operation applied to human females. But cancer of the ovary occurs in 12 out of every 100,000 women. And, when it is first discovered, in about 50% of the cases both ovaries are affected. The possibility exists that where both ovaries have to be removed, a woman might still be able to have children by having another woman's ovaries transplanted into her. But, the children would be the other woman's.

The ovary transplanting operation on dogs is done by shifting the ovaries through a slit in the capsule that encloses each. At first Dr. Whitney used fine catgut to sew the cuts, but since this caused adhesions, he changed to silk sutures. He also found it necessary to perform the operation when the recipient dog was in heat. Many experiments in other parts of the sexual cycle failed.

Evidence of rejuvenation of the transplanted ovaries came this month from Dr. Greene who examined sections of them under the microscope. He reported that the ovaries, after they had been transplanted, showed "all the signs of a young gland with many follicles." Follicles are the little sacs in the ovary which contain the egg cells. An old dog's ovaries rarely shows signs of these.

Brownie's two litters were composed of ten dogs each. Because she retained one of her own ovaries, five dogs of each litter were mongrels. But the other five were pure cocker. Said Dr. Whitney, "There was no question of either their maternity or their paternity. Both were cocker."

Brownie is not the only dog to have another dog's puppies. The first was a black-and-white Dalmatian named Imogene. Dr. Whitney replaced her ovaries with those of an 18-year-old cocker. At that age, the cocker was far beyond the time she could produce a litter.

Imogene came into heat on the cocker's timetable rather than her own. Then, because Dr. Whitney couldn't find a male cocker large enough, he bred the Dalmatian to an English setter. Two puppies were born. Neither was any relation to a Dalmatian.

Last month, Dr. Whitney received a letter from a veterinarian in Denmark, Anker Scheel Thomsen, reporting successful operations on setters, a German pointer and an airdale, an Alsatian wolfhound and a boxer, and a 12-year-old mongrel with a two-year-old fox-terrier. Said Dr. Thomsen, the Alsatian had two boxer puppies, "who are still alive and well."

Meanwhile Brownie's thoroughbred cocker spaniel puppies are not recognized by the American Kennel Club under present rules. Dr. Whitney plans to obtain a really famous dog, transfer her sexual glands to a dog of a different breed and then put the offspring up to dogdom's social register as a test case.

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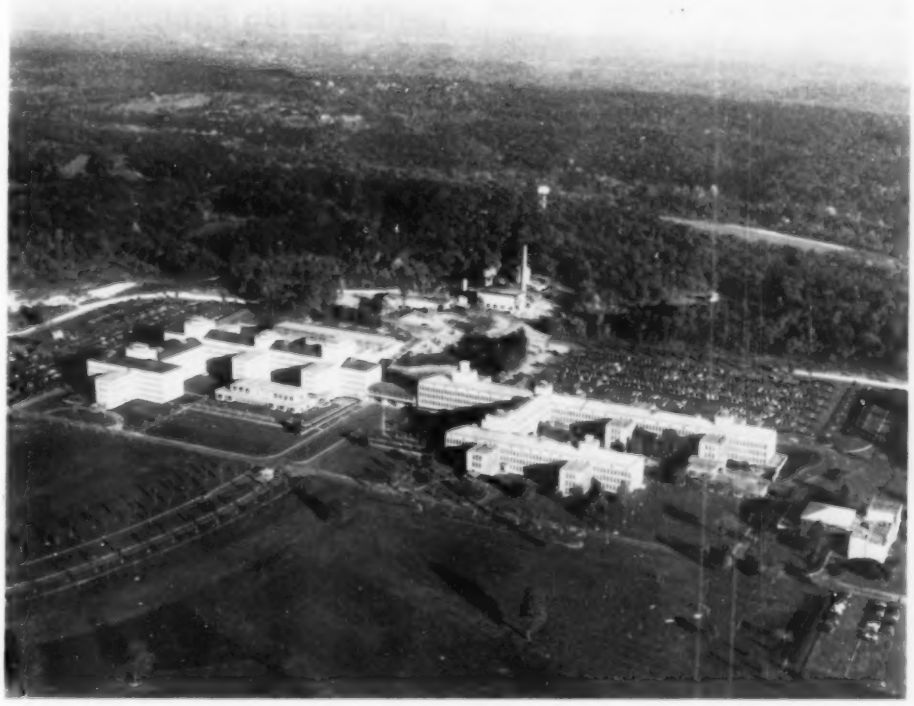

TELEPHONE RESEARCH HOME—The latest contributions of science and technology are applied to Bell System communications in the above laboratories. The country location about 25 miles from New York was selected to escape the noise, dust and vibration and electrical interference encountered in a metropolitan center. The acoustics building, containing the famous "dead room" is at the extreme lower right.

PSYCHOLOGY

Body Learns Without Brain

Learning goes on in spinal cord, psychologists maintain. A kitten that walked, although its spinal cord was separated from its brain, is part of the evidence.

➤ SOME parts of the body can learn to do things without benefit of the brain, it appears from research reported by Dr. Phil S. Shurrager and R. A. Dykman of the Illinois Institute of Technology, Chicago, at the meetings of the American Association for the Advancement of Science.

The learning goes on in the spinal cord, these psychologists maintain. This is contrary to the "traditional" viewpoint of other psychologists, neurologists and physiologists that learning is restricted to the brain alone.

Moving pictures of a kitten that walked, although its spinal cord was separated from its brain at the age of four weeks, were shown as part of the evidence for learning ability in the spinal cord.

This kitten's spinal cord was cut at the level of the first lumbar vertebra, or a little below the middle of the back. The animal was kept in excellent physical condition and was exercised daily by massage and manual and electrical manipulation.

Thirteen weeks after the spinal cord had been cut, the kitten could stand and walk for 10 minutes at a time, crouch and jump as much as a foot, run for three or four feet and turn corners without support, depending upon balancing movements in the hind part of the body.

Step reflexes from the spinal cord are not enough to account for the walking the cat finally did, in Dr. Shurrager's opinion. He pointed out that the development of coordination did not follow a stereotyped pattern or proceed smoothly. Instead, there were plateaus and then slips back to less good performance. Improvement was gradual and seemed to vary with the amount of training.

Conditioned reflex tests on cats immediately after the spinal cord was cut and some weeks later showed, Mr. Dykman reported, that the conditioning, or experimental learning, over a period of days resulted in gradual improvement in learning efficiency. Experimental forgetting, or extinction of the conditioned reflex, resulted in a gradual loss of the learning to the point of disappearance of the learned response.

"The spinal cord," Mr. Dykman declared, "can no longer be regarded as a reflex and communication center. It has the property of modifiability as shown by its capacity to learn independent of the rest of the spinal cord and brain.

"Learning is possible in all the gray matter of the brain and spinal cord."

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ORNITHOLOGY

The Huias Go Pffht, End Up in Yale Museum

➤ MARITAL cooperation just didn't work out for Mr. and Mrs. Huia (pronounced who-ya). In fact their whole family has gone pffht, despite the fact that their way of life was one of the most beautiful examples of married partnership nature had to offer.

The Huias once were rather common birds who lived in New Zealand. Yale University's Peabody Museum has just acquired a pair of Huias, in good condition except for the fact that they're stuffed and have been dead since before 1907, when the last live Huia was seen.

Mr. and Mrs. Huia had to get along well together in order to eat. He had a short, stout and straight beak, while hers was long, slender and curved. With his beak, he cut through the heavy bark of trees and then she probed underneath for palatable insects for both of them.

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ASTRONOMY

Dust Changes Starlight

Dust particles spinning like a football in space are the latest proposed theory to explain the polarization of light from stars, one of the newest astronomical puzzles.

➤ ELONGATED dust particles containing a small amount of iron and spinning like a football end-over-end in a magnetic field in space were proposed to the American Astronomical Society, Tucson, Ariz., to explain the polarization of light from the stars.

This new theory to solve one of the newest puzzles in astronomy was proposed by Dr. Jesse L. Greenstein, of Mount Wilson and Palomar Observatories, and Prof. Leverett Davis, Jr., of the California Institute of Technology.

In recent years astronomers have found that the light from certain stars is polarized partially. Some of the light rays are constricted to vibrate in certain planes instead of being free to vibrate in planes of random orientation. Evidence for this has been found chiefly by John S. Hall, now of the U. S. Naval Observatory, and W. Hiltner, of Yerkes and McDonald Observatories. Their observations have been interpreted as requiring a specific orientation of elongated particles of interstellar dust. Through clouds of matter containing dust and gas all starlight must pass on its way to the earth from the distant parts of the Milky Way system of stars. These clouds of interstellar matter are not uniformily distributed, but distinctly patchy in their distribution.

The only mechanism for orienting particles of matter seems to be the action of a magnetic field in space on the iron content of the interstellar dust grains. Recently, to explain the origin of cosmic rays, Dr. Enrico Fermi of the University of Chicago proposed the presence of a magnetic field in space (intensity about 3 x 10-5 gauss). Dr. Fermi imagines this field to exist, with lines of force parallel over small regions, but randomly oriented from cloud to cloud. The astronomical observations of polarization favor the uniformity of the direction of the field over regions measuring 300 light years across or more.

Chief difficulty with the magnetic field hypothesis has been the necessity to fill space with particles of dust composed mostly of iron and therefore more or less permanently magnetized (ferromagnetic) and relatively at rest so the magnetic field could act on them.

Dr. Greenstein had already shown that near bright stars the gases are at temperatures of as much as 10,000 degrees. Each dust or gas particle is constantly being bumped into by other particles, all moving around at high speeds. Such collisions would destroy any orientation produced by a magnetic field and prevent the dust particles from doing any polarizing of starlight.

From a football game, the California scientist could have got their explanation as to how spinning particles could go on spinning and nevertheless "look" to light passing through them like oriented particles. If a football spins end over end as it goes through the air it looks like a circle as seen from the side. But it looks like the ellipse that is seen from the front or back. If it is spinning around its long axis, the way it is usually thrown, it looks like a circle from its front or back, but like an ellipse from the side. Dr. Greenstein believes that spinning interstellar dust particles can be lined up to spin like end-over-end footballs by a magnetic field of the intensity proposed by Dr. Fermi. Small amounts of iron in the dust particles are all that are needed to make them susceptible to the action of the magnetic field, that is, paramagnetic. They need not be mostly iron.

"Thus we picture these slightly paramagnetic dust grains as spinning rapidly around an axis which keeps being disoriented by collisions with hydrogen atoms, while the magnetic field patiently keeps trying to keep the axes oriented," Dr. Greenstein said. The shortest axis of a dust grain, regardless of its shape, will be the one around which it will tend to spin.

Statistically, because of the collisions, not all the particles will be properly oriented to produce polarization, but enough to produce the partial polarization actually observed can be explained by this theory. In the absence of his theory, Dr. Greenstein points out, a magnetic field 10 times as strong would be needed, the interstellar cloud would have to be at a temperature near absolute zero (10 degrees Absolute) and the particle would have to be ferromagnetic.

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OCEANOGRAPHY

Present Water Shortages Are Only Mild Beginning

➤ THE current water shortages, not only in New York but throughout the world, are only the beginning. In a few thousand million years or so there won't be any water left at all. Dr. Hans Pettersson, Swedish professor of oceanography, made that clear in a lecture to the Royal Institution of Great Britain.

Dr. Pettersson said that the earth is suffering from progressive dessication, an ailment common to all aging planets. It is drinking all the water in the oceans, converting the water into components of its solid crust.

"It will then have reached the present tragic state of its neighbor Mars, with its oceans gone," said Dr. Pettersson, "and with them, inevitably also, its oceanographers."

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PHYSICS

Radioactivity Detector Has Probing Nose

➤ LESS danger to workers using radioactive products and byproducts from atomic energy developments is promised with a new radiation detector which has a four-foot probing nose. The new instrument was revealed by General Electric in Schenectady, N. Y.

The business end of the detector is an electronic tube at the tip of the probe. Attached to the tube is a phosphor, a material that gives off light in the presence of radioactivity. Light from the phosphor acts upon the electronic tube, and is converted into electrical energy. This activates a meter in the instrument itself.

A lightweight battery, carried in a special case by the operator, provides the electric power for the instrument.

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LONG RANGE DETECTION—A long-probe radiation detector, which permits the operator to measure radioactivity from a distance, is demonstrated by Charles Lemmond, engineer in the G-E General Engineering and Consulting Laboratory, Schenectady, New York.

PSYCHOLOGY

Men Are Weaker Sex

Men undergo more physical and emotional illnesses which lead to higher death rate. They also are faced with more dramatic crises indicative of aging.

➤ MEN are really the weaker sex. They have more severe emotional illnesses, more physical illnesses leading to death, a higher alcoholism, delinquency and suicide rate.

These are the findings of Dr. George Lawton, New York psychologist who has specialized in the problems of the middle years and old age. Speaking at Cooper Union, he pointed out that it is much more difficult for men to age successfully than women.

Dr. Lawton stated that men both in the realm of employment and sexual performance face more dramatic crises indicative of aging. The dividing line between the first and last half of life in men and women is very much sharper for the male. He presented a list of rules of "What Every Man Should Know," stressing that a man as he got older had to exchange speed and quantity for strategy, skill and quality.

Many a tired businessman is tired because he is overworking to escape from close emotional relationships with his wife and members of his family, Dr. Lawton believes.

A modern woman needs even more than her home, a husband and children in order to give her a complete sense of purpose and intellectual stimulation, Dr. Lawton pointed out. He said that every woman, regardless of her financial situation, needed a part-time job, community activities, and some creative outlet. He also stressed the point that women in the middle-income bracket tended to do less work than they should and their husbands do more work. In such a case a wife, in order to help her husband enjoy life more and perhaps even live longer, should help share her husband's work load and share his economic and mental burdens.

Dr. Lawton's recommendation was that both men and women undergo regular examinations, both medical and psychological. The psychological examination for middle-aged men and women would have the following objectives:

1. To show executives and professional men how to slow down, to switch from a strenuous life to a slower but still as interesting, nourishing one.

2. To show inter-relationship between job attitude and philosophy of life on one hand—and sexual difficulties (impotence, etc.) on the other. In women, the relationship between career and difficulty in establishing an emotionally satisfying relationship with men.

3. To save marriages. Seventy-five percent of marriages ending in divorce could be saved if *both* husbands and wives went to psychologists not later than 10th or 15th anniversary. Fifty percent could be saved if one partner went. Lukewarm marriages could be improved.

4. Relationships with children would be far happier as the children grow older, happier for both child and parent.

5. To study aptitudes of men and women; see changes in vocational interests and abilities; suggest job changes for men. Women could build up life outside of husband and children. Might need a real job some day, whether for money or not.

6. Both men and women need psychological guidance for creative outlets, even if they pass muster as far as personal adjustments go.

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HOME ECONOMICS

Handi-Coat Is Attractive, Useful and Rain Repellent

➤ HANDI-COAT may soon become a familiar word to women who do the family shopping. It is the name given to a new, government-designed coat of light-weight, water-repellent cotton shown by the U. S. Department of Agriculture in Washington, D. C.

As part of a program to make available useful clothing that gives protection against rain, snow and sun, the coat was designed by Clarice Scott of the department's Bureau of Human Nutrition and Economics. Manufacturers of ready-to-wear and patterns can get the design of the coat without charge.

Features of the coat include a slot for a shopping list and a sleeve dispenser for paper handkerchiefs, in the sleeve, a place for pen and pencil to stand upright in the pocket, a long zipper closing, a pleat that allows comfortable walking, and a plastic carryall that folds into a pocket when not in use. A plastic film that slips over the grocery bag in the carry-all for protection against rain can be folded into a little pocket on the outside of the carry-all when not in use.

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On This Week's Cover

➤ A .22 caliber bullet smashed through a glass jar, then broke an electrical conductor to take this picture. Breaking of the conductor set off a high-speed photolight, which illuminated the action for two-millionths of a second.

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SCIENTIFIC SHOPPING—The handi-coat carry-all, made with plastic over stiff cardboard, is right size for the largest grocery bags. It can be carried to the store folded like a purse.

ASTRONOMY

Brilliant Stars in South

Orion, the warrior, and many other stars crowd the southern part of the sky. The planets will appear later on January nights.

By JAMES STOKLEY

➤ AS one looks at our accompanying maps of the January evening skies, particularly that for the south, he gets a very definite impression of crowding. This is not from any fault of the draftsman, but from the fact that the stars happen to be arranged that way. For this part of the sky actually contains more brilliant stars than any similar area.

The maps show the skies as they appear around 10 o'clock on the evening of Jan. 1, an hour earlier at the middle of the month and two hours earlier at the end. Perhaps the best group to start with is that of Orion, the warrior, characterized by the three stars in a row forming his belt. Above the belt is Betelgeuse, whose name is marked, and Bellatrix (just under the I in Orion) which are supposed to indicate the shoulders. The two bright stars below the belt—Rigel, and Saiph, to the left—are in his legs.

The curved row of stars to the right of the name form an upraised club which he uses to defend himself from charging Taurus, the bull, next constellation to the right. Here we find the bright star Aldebaran, marking the animal's eye, and the V-shaped group called the Hyades which forms his face. To the right, in his shoulder, is the little cluster of fainter stars we call the Pleiades.

Two Dogs Are Visible

Following Orion are two dogs, Canis Major and Canis Minor. The greater dog is lower, and contains Sirius, the "dog-star," brightest of all the stars visible in the night sky. The lesser dog, above, is marked by another brilliant star, Procyon. Still higher, and toward the east, we come to Gemini, the twins, with Castor and Pollux, the latter of the first magnitude. And almost overhead is another of the first magnitude, Capella, in Auriga, the charioteer.

Just a little to the west of Auriga is the constellation of Perseus, the champion. Below Perseus, toward the west, is Andromeda, the princess he rescued in an old story of mythology. And below this group is Pegasus, the winged horse.

Saturn to Rise

This is not a very good month for planets, and none are marked on our maps. Venus, which has been so brilliant in the western twilight recently, can still be glimpsed low in the west after sunset at the beginning of January, though later it will disappear. On the 31st it will be in the same direction as the sun. Saturn rises about 11 around Jan. 1, in Leo the lion, part of which is shown on our maps low in the east. Leo is followed by Virgo, the virgin, and this group is the present location of Mars, which appears by 1 a.m. Mercury is farthest east of the sun at the beginning of the month, and remains in the sky after sunset, but it will be hard to locate. Jupiter is too nearly in the direction of the sun to be seen.

Taurus, now so conspicuous, is probably one of the most ancient of the constellations. More than 4000 years ago the sun stood in this group at the vernal equinox, the beginning of spring, but because of the slow turning of the sky, called "precession of the equinoxes," it is now in Pisces, the fishes, when that season starts. In Grecian mythology, Taurus was supposed to represent the bull into which Jupiter turned himself to carry Europa over the sea to the continent that now bears her name.

Dust Surrounds Pleiades

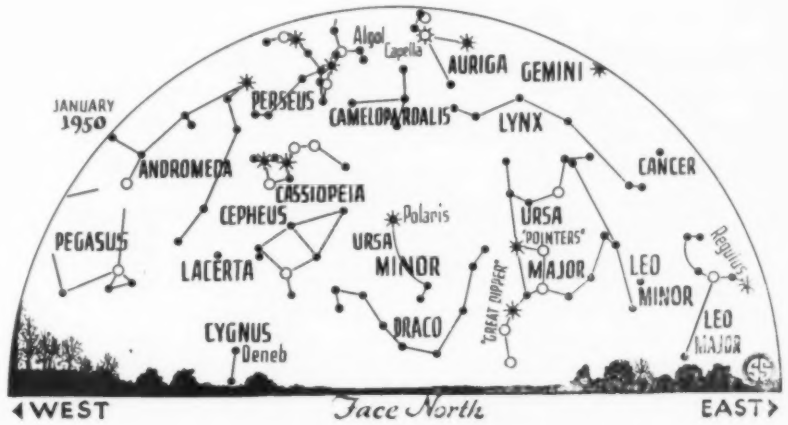
The little cluster of stars in the bull's shoulder called the Pleiades has several other names. Sometimes it is erroneously called the little dipper, because the stars are arranged something like a dipper. Another popular name has been the meat cleaver. Like Taurus, the Pleiades are famous in mythology. They were the seven daughters of Atlas, their mother being the nymph Pleione. Their names were Alcyone, Merope, Celaeno, Taygeta, Sterope, Electra and Maia, and these same names are given to the brighter stars in the cluster. In addition, the names of their parents are also given to two of the stars, making nine that have names, and these are doubtless the faintest stars in the sky to which proper names have been applied. It is hard to see all nine with the naked eye, and only six are ordinarily visible.

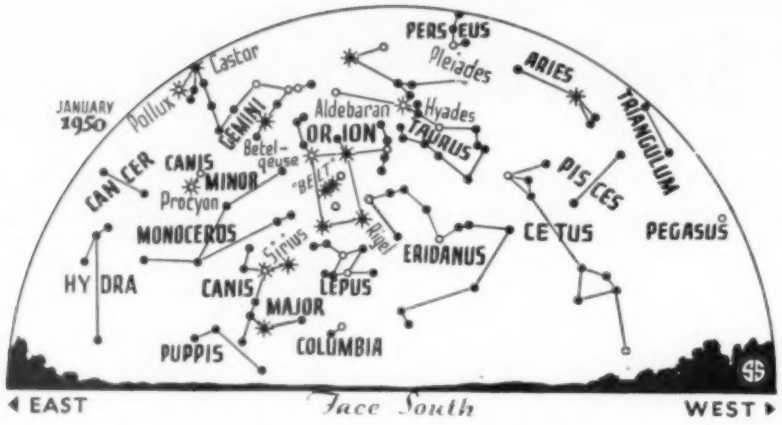
Through a small telescope this cluster forms a remarkable sight, as dozens of stars are then seen. The entire group is surrounded by a faint nebulosity not visible even with a telescope, but which shows up on astronomical photographs. This seems to be a vast cloud of cosmic dust through a wide region of space, of which parts are made to shine by the light from nearby stars.

Perseus Near Pleiades

Another interesting star seen in January is in the figure of Perseus. This group has somewhat the shape of two fish hooks. One of the hooks, which marks the foot of Perseus, almost reaches to the Pleiades, and passes near the star Algol, one of the best-known of variable stars. Its name comes from the Arabic "al Ghul," meaning "the demon," making it rather peculiar, for the Arabs rarely gave uncomplimentary names to the stars.

Though only the brighter is visible, Algol is really two stars—a bright and a faint one revolving around the center of gravity of the pair. Every two days 21 hours the faint star partially eclipses the brighter, causing it to appear considerably fainter than usual. In the astronomical time table following this article are given the times of minimum light. It takes about 10 hours to go down and come back to normal brilliance. The faint star is not really dark, as we know by the fact that there is a slight reduction in light when it is eclipsed by the bright member. The system normally shines with the combined light of both,





the bulk of the light coming from one only.

Time Table for January

Jan.	EST	
1	6:00 a. m.	Mercury farthest east of sun
3	1:00 a. m.	Earth nearest sun, distance 91,445,000 miles
4	2:48 a. m.	Full moon
8	11:53 p. m.	Moon passes Saturn
10	5:08 a. m.	Moon passes Mars
11	5:31 a. m.	Moon in last quarter
13	1:00 a. m.	Moon nearest, distance 225,700 miles
	2:15 a. m.	Algol at minimum
16	11:04 p. m.	Algol at minimum
17	noon	Mercury between earth and sun
18	2:59 a. m.	New moon
19	8:37 a. m.	Moon passes Venus
	7:53 p. m.	Algol at minimum
22	4:42 p. m.	Algol at minimum
25	5:00 p. m.	Moon farthest, distance 251,200 miles
	11:39 p. m.	Moon in first quarter
31	2:00 a. m.	Venus between earth and sun

Subtract one hour for CST, two hours for MST, and three for PST.

Science News Letter, December 31, 1949

GENERAL SCIENCE

Vogt's Stand Costs Job

➤ URGING birth control as a means of reducing populations and therefore conserving a nation's natural resources has cost a man his job.

The man is William Vogt who has been chief of the Pan-American Union's conservation section since 1943. In that position, Mr. Vogt studied soil and other conservation problems in Latin America and advised the governments of those nations on resources and conservation problems. His work has been internationally recognized by fellow scientists.

Last month Mr. Vogt quietly resigned from his post at the Pan-American Union. Digging into the situation, Science Service found the following facts:

1. Mr. Vogt had been told last July to cease his literary activities. This followed publication in the Saturday Evening Post of his article on weaknesses of President Truman's Point Four Program.

2. A year earlier, in May or June, 1948, Ambassador Felix Nieto del Rio of Chile had voiced objections before the Pan-American Union's governing board to parts of Mr. Vogt's book "Road to Survival" following their publication in Harper's Magazine. (An embassy spokesman, in the absence of Ambassador del Rio who he said is out of the country, said the objection was not to Mr. Vogt's scientific observations but to his political references. The ambassador felt, said the spokesman, that Mr. Vogt should make a choice: either "continue to propagandize or leave the Union.")

3. Dr. Alberto Lleras, Secretary General of the Pan-American Union, declined to comment on the assertion that Mr. Vogt had been muzzled, saying, "There seems no reason to issue a statement. Mr. Vogt knows why he submitted his resignation. He did so voluntarily. I did not ask him for it."

4. Another official of the Pan-American Union, who refused to allow use of his name, stated that the question had arisen "whether you can appropriately work for an international organization and at the same time write popular articles which criticize member governments."

In his book and other writings Mr. Vogt has bluntly charged that governments in Latin America as well as throughout the world have failed to handle their problems of reducing populations and conserving natural resources. He contends that unless steps are taken to check the growth of population, there will never be enough food and other resources, no matter how carefully they are conserved.

Mr. Vogt himself when asked to comment said, "As far as I am concerned, there is no controversy between me and the Pan-American Union.

"I would prefer to tell you about my new book," Mr. Vogt said. It will be about "how the Scandinavians have come to terms with their environment. It will be a sort of sequel to 'Road to Survival,' answering some of the questions raised there," he said.

When his present researches on it are finished, he plans to go to Europe next year to gather further material for the book.

Science News Letter, December 31, 1949

MEDICINE

Pattern of Diabetes Heredity Explored

➤ A TENDENCY, or predisposition, to diabetes is inherited through a single recessive gene, Drs. Arthur G. Steinberg and Russell M. Wilder of the Mayo Clinic reported at the meeting of the American Association for the Advancement of Science.

A gene is a unit in the chromosome which carries a hereditarily transmissible character.

When both parents are diabetic, every one of their children is a potential diabetic, the Mayo scientists stated. Half the brothers and sisters of a diabetic person are potential diabetics if one parent is diabetic, and one-quarter of a diabetic's brothers and sisters are potential diabetics if neither parent is diabetic.

The report, the doctors stated, is preliminary and based on the first 422 case histories which have been collected. The study was undertaken to clarify the nature of the hereditary pattern in diabetes, which has been a matter of "considerable disagreement." Because the disease starts at a "variable and usually late age," the doctors pointed out, the "possibility of prevention is great."

The age of a diabetic parent at the time the diabetes started does not influence the age at which the diabetes will start in diabetic children.

The disease is more frequent, the doctors found, in children of lower birth order, that is the first born children, than among those of higher birth order.

If neither parent of a diabetic is diabetic, about 6% of the diabetic's brothers and sisters have the disease. If one parent is diabetic, about 12% of the brothers and sisters of the diabetic have the disease.

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The U. S. Bureau of Mines has several *minerals reference "libraries"* containing drill-core samples of ore and records of each sample; these specimens are cylinder-shaped, being bored out of the earth with hollow drills.

The new roof on the *U. S. Capitol* at Washington contains a two-inch insulation of "glass" in the form of a special type composed of millions of tiny glass cells filled with air.

AGRICULTURE

Better Farming Is Possible

➤ AMERICA'S abundant farm production can be boosted still further by placing the new crops and new techniques that research has unearthed into the hands of the farmers.

Agricultural research has developed many improved crops and more efficient methods that are still not widely used, said Robert M. Salter, chief of the Bureau of Plant Industry, Soils, and Agricultural Engineering, in his annual report.

One of the best ways to get this knowledge out to the farmers, he found, is the establishment of pilot farms in farming districts. The farmers can then see for themselves how practical or profitable the innovations are.

Improved use of the soil through modern methods of soil classification is one of the technical achievements which has not been applied on anything like the scale that it should, he pointed out. Soil classification permits the farmer to predict accurately whether a crop grown experimentally elsewhere would grow successfully on his fields.

To the pool of past technical achievements, government scientists are constantly adding new knowledge. He cited, for one example, the discovery after a 50-year search of a sugar beet that produces single seeds. With the present seed clusters, it is necessary to wait until the plants begin coming up and then thin out the excess plants by hand. Now that a single-germ seed type has been developed, scientists are working on a commercial variety which will combine with it the other desirable qualities.

Other new developments of promise: cultivation of an imported plant called red squill from which a rat poison can be made that is harmless to other animals; use of 2,4-D as a spray on apples to prevent them from dropping; the importation of about 10,000 different plants to be tested for their usefulness in this country; and dozens of other investigations of farm activities ranging from food crop raising to farm electrification and farm machinery.

Science News Letter, December 31, 1949

● RADIO

Saturday, January 7, 3:15 p.m., EST

"Adventures in Science" with Watson Davis, director of Science Service, over Columbia Broadcasting System.

Dr. Dean Burk, National Institutes of Health, Public Health Service, Bethesda, Md., will talk about "Future Energy from Photosynthesis".

BOTANY

NATURE RAMBLINGS

Guardians of the Snow

➤ CONIFER trees and snow always seem to belong together.

However, conifers are by no means confined to the lands of snowy winters, but so ineradicable is the picture of snow-surrounded evergreens that when Rudyard Kipling wanted to pack the geographical grandiosity of the Bristish Empire into a single phrase, he wrote of "dominion over palm and pine."

Although it is true that the coniferous trees can be found in lands that reach toward the sun (in our own South, they dispute dominion with at least one kind of palm!), nevertheless they do belong first to the North. Or perhaps it would be more proper to say that the North belongs to them. They circle the boreal end of the earth like a dark-green garland. They are the last trees that look upon the desolate tundras that run to the Arctic sea. Willows and populars and birches push toward the North, too; but they surrender and dwindle to bushes, while the spruces still stand up as trees.

Incidentally, Kipling limited the northern extent of his Empire unnecessarily (though probably quite unconsciously) when he made the pine the symbol of the North. Spruces run far to the north, beyond the last of the pines, just as the pines leave the spruces behind in their southerly extension. Their ranges overlap, but it is the spruce that in general stays within the circle of deep annual snow.

There is good reason for that, for the snow is more necessary to the spruce than it is to the pine. Some of the evergreens—and pine and juniper are outstanding among them—can stand a good deal of drought. Not all kinds of pine; but there are enough dryland pines to make good forests in lands where the slow seep of melting snow never figures as a source of ground water.

Not so the spruces, however, nor yet their cousins the firs. They are rather more particular than most pines, and seek the more moist regions. Where they grow in competition with pines, the spruces and firs cling to the shady, damp sides of ravines. Lands that they dominate are usually found to be perennially moist. In part, these conifers attend to that themselves, for their dense foliage makes a superior shade for the snow that lies under their canopy, holding it against the ardor of the spring sun and permitting it to melt only slowly—and to the advantage of their roots.

(Reprint from SNL, Jan. 4, 1936)

Science News Letter, December 31, 1949

PSYCHOLOGY

Women Rely on Sight

➤ WOMEN put more reliance in what they see than in what they hear or feel when they have to decide something through the use of these senses.

That "women are more affected by the nature of their surroundings" than men is the conclusion drawn by Dr. H. A. Witkin, department of psychology, Brooklyn College. He subjected men and women to tests: centering a rod in a frame, putting a tilted room upright, measuring body sway and finding hidden figures.

From these tests he found women rely less on impressions from their bodies than men. Although many persons were tested, Dr. Witkin found his averages using approximately 250 women and 135 men for the tilting room and rod and frame trials, and about 50 of each sex for the body sway and hidden figures tests.

To tell how a person judges the upright no matter in what position his body is and no matter how the surroundings appear, Dr. Witkin uses a small room within which is a chair. Either the room or the chair may be tilted to any degree left or right from inside or outside the room. They may be tilted alone or together, to the same side or opposite sides, and at the same speed or different speeds.

Since nothing outside of the room can be seen by a person taking the test, the object is to bring either the chair or the room to an upright position. In some instances Dr. Witkin found that the room could be tilted as much as 56 degrees, yet be considered vertical by some.

In one series of trials, where room and chair were initially tilted to the same side, men on the average saw the room as straight when it was tilted 11.5 degrees. Women, however, thought it was straight when it was tilted 17.7 degrees on the average.

Reason for the differences in perception brought out by the tests is due to differences in personal characteristics between men and women, Dr. Witkin believes. He is making an intensive personality study of many men and women also taking the perception tests. They include a normal group selected from among students at Brooklyn College and an abnormal group, patients at a mental hospital in the state. Dr. Witkin is also making a study of the perception of children at different ages. Collaborating with him in his work are Dr. S. Wapner, Clark University; Dr. P. Bretnall, Brooklyn College; Dr. M. Hertzman, City College of New York; K. Machover, Kings County Hospital, New York City; and T. Leventhal.

Science News Letter, December 31, 1949

BIOLOGY

Algae, "Plus" and "Minus" Sexes, May Aid Food Study

➤ A TINY plant with two sexes which are so much alike they are called "plus" and "minus" may help science to understand how green plants manufacture their food by photosynthesis, said Dr. Ralph A. Lewin of Yale University before a meeting of the American Association for the Advancement of Science.

The plant is the one-celled, free-swimming alga, Chlamydomonas. It goes through its reproductive cycle in as little as nine days, which makes it a favorable object for genetic study, Dr. Lewin said.

By inducing mutations, or hereditary changes, with radiation, ultraviolet light, or other means, and then comparing the mutant with the normal type, Dr. Lewin suggested that "From their differences (we can) learn much about the process of photosynthesis."

The two "sexes", plus and minus, "cannot be distinguished by any visible character except by their mating behavior, where the difference might be said to be psychological," he said.

Science News Letter, December 31, 1949

Words in Science—Absorption-Adsorption

➤ THE two words absorption and adsorption are often confused just because the appearance of the words in type is so similar. The meaning is somewhat different.

Absorption is the taking up or soaking up of a liquid or a gas as a sponge takes up water.

Adsorption is the process of sticking to the surface rather than penetrating it as with absorption. Gases sometimes adhere to solids by adsorption. This is the basis of the gas mask. The poison gases are adsorbed by the charcoal contained in the mask, the charcoal being finely pulverized so as to present an enormous surface to the poison gas.

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• Books of the Week •

TO SERVE YOU: To get books, send us a check or money order to cover retail price. Address Book Dept., SCIENCE NEWS LETTER, 1719 N St., N. W. Washington 6, D. C. Ask for free publications direct from issuing organizations.

THE ADVANCEMENT OF SCIENCE—*British Association for the Advancement of Science,* 130 p., illus., paper, six shillings. Addresses delivered at the annual meeting of the BAAS in Newcastle upon Tyne, August 31 to September 7, 1949.

APPLIED PRACTICAL RADIO-TELEVISION—Coyne Technical Staff—*Coyne Electrical & Radio-Television School,* 392 p., illus., $4.25. Covers practical procedures with a chapter on color television. For radiomen interested in getting into television.

THE AXONOMETRIC METHOD OF DESCRIPTIVE GEOMETRY—William Henry Roever—*Edwards Brothers,* 75 p., illus., paper, $3.00. For those interested in pictorial representation of the objects of space upon a plane.

DECAY OF TIMBER AND ITS PREVENTION—K. St. G. Cartwright and W. P. K. Findlay—*Chemical,* 294 p., illus., $7.50. A reference book dealing with the problems of timber decay and preventive methods.

FOR THE CHILDREN'S BOOKSHELF: A Booklist for Parents — Federal Security Agency — *Gov't. Printing Office* (Publ. N. 304), 41 p., illus., paper, 15 cents. A list of a few books of each kind, grouped into classes with references to children's interests and to their varying levels of development.

MACHINERY'S HANDBOOK—Erik Oberg and Franklin D. Jones, Eds.—*Industrial Press,* 14th ed., 1911 p., illus., $7.00. A basic reference containing data and formulas for use in either designing or building any type of machine or other mechanical device.

MUSICAL APTITUDE TEST (series A): For Grades 4 through 10—Harvey S. Whistler and Louis P. Thorpe—*California Test Bureau,* 23 p., illus., paper, $3.00. (I. B. M. cards: four cents). Provides a diagnostic analysis of potential ability in the field of music. Given directly from a piano keyboard.

A NEW ADIANTHINE LITOPTERN AND ASSOCIATED MAMMALS FROM A DESEADAN FAUNULE IN MENDOZA, ARGENTINA—George Gaylord Simpson and Jose Luis Minoprio—*American Museum of Natural History,* 27 p., illus., paper, 15 cents. A brief description of a few fossil mammals.

A NEW OLIGOCENE RODENT GENUS FROM PATAGONIA—Albert E. Wood—*American Museum of Natural History,*—54 p., illus., paper, 15 cents. A report on two nearly complete and largely articulated rodent skeletons.

ORGANIZATION AND SUPERVISION OF ELEMENTARY EDUCATION IN 100 CITIES—Federal Security Agency—*Gov't. Printing Office,* 84 p., illus., paper, 25 cents. An analysis of a study made by staff members of the Division of Elementary Education.

REPORT OF PROCEEDINGS—Advisory Council on Industry-Science Teaching Relations—*National Science Teachers Association,* 24 p., paper, free upon request to publisher, 1201 16th St., N. W., Washington 6, D. C. Addresses presented at the regional conference in Pittsburgh, Pa., September 30, 1949.

SOILS: Their Physics and Chemistry—A. N. Puri—*Reinhold,* 550 p., illus., $7.00. The author presents his views of the structure and chemical behavior of soils.

X-RAY TREATMENT: Its Origin, Birth and Early History—Emil H. Grubbe—*Bruce,* 153 p., illus., $3.00. The author presents his views upon the origin and birth of X-ray therapy.

YOUR FARMHOUSE HEATING—United States Department of Agriculture (Misc. Publ. No. 689)—*Gov't. Printing Office,* 23 p., illus., paper, 15 cents. A technical report.

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AERONAUTICS

Trophy to Commission

➤ THE highly-prized Collier Trophy, America's number one aviation award, will go this year to a government commission, rather than to an individual. The Radio Technical Commission for Aeronautics will receive the trophy from the President of the United States on Jan. 10, 1950, the presentation being in the executive offices of the White House.

This commission, known as RTCA for short, is receiving the trophy for developing a system of air navigation and traffic control now officially adopted for American use by the U. S. Civil Aeronautics Administration, the U. S. Air Force and the Navy. Facilities for its use are being rapidly installed. It will probably become international in the near future.

The RTCA, a cooperative association of all government agencies and industry organizations concerned with aeronautical telecommunications, in developing its plan had to reconcile the policies and ideas of seven government agencies, including the Air Force, the Navy and five civil organizations. All these are directly concerned with air traffic problems.

It is the first time in aviation history that the military and civilian aviation leaders, as well as government regulatory groups, have reached general agreement on the over-all system of navigation and landing aids which all believe should be developed and installed in the United States.

The system of air navigation and traffic control to facilitate safe and unlimited aircraft operations under all weather conditions includes the use of an instrument landing system, radar-radio ground control approach apparatus, the use of very high frequency in radio communications to planes, and the installation of very high frequency radio ranges to guide pilots across country.

Neither the instrument landing system, developed and advocated by the Civil Aeronautics Administration and known as ILS, nor the radar-radio Ground Control Approach (GCA) pushed by the military was deemed adequate alone by the RTCA. The plan devised for immediate use combines both.

The very high frequency (VHF) radio range proposed sends static-free communications to pilots. With this omnirange, as it is called, a pilot can fly a radio course to or from any station with relatively simple and inexpensive equipment in his plane. Also the pilot may have in his cockpit an instrument that will tell him continuously in miles how far he is from the station to which he is tuned.

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ASTRONOMY

Explosion on Star Puzzles Astronomers

➤ ASTRONOMERS are pondering the significance of a violent explosion which they observed by pure chance on a cosmic neighbor of the sun.

The speculation of University of California astronomers at Lick Observatory, Mt. Hamilton, Calif., is that the phenomenon may be a mechanism of nature similar to the release of atomic energy.

Dr. and Mrs. Gerald E. Kron, of the astronomical staff, observed the explosion while they were doing routine work with photo-electric equipment attached to the observatory's 36-inch telescope.

In the space of 15 minutes the star flared to twice its normal brightness and then returned to near normal brightness. The star, known as Cin 20 1224, is not a nova, or exploding star. It is actually fainter, redder and smaller than the sun, which is a rather ordinary star.

Dr. and Mrs. Kron's calculations indicate that only a small spot on the star was involved in the explosion. This spot probably had a diameter about equal to that of the earth.

The whole star has a diameter about 60 times that of the earth. The astronomers calculated that in order to cause a two-fold increase in light received from the star, the amount of light emanating from the affected spot must have increased 2000 times, its temperature rising from 5,000 degrees to 20,000 degrees Centigrade.

A similar flare-up was recently observed by Dr. W. J. Luyten, of the University of Minnesota, who found such a phenomenon on a photographic plate, and this is the fourth of the sun's neighbors known to flare up. The star observed by Dr. and Mrs. Kron was the first of this type to be observed and carefully measured during the actual act of flaring up.

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• New Machines and Gadgets •

For addresses where you can get more information on the new things described here, send a three-cent stamp to SCIENCE NEWS LETTER, 1719 N St., Washington 6, D. C. and ask for Gadget Bulletin 497. To receive this Gadget Bulletin without special request each week, remit $1.50 for one year's subscription.

POCKET-HEATER, the size of a thin cigarette package, generates an even temperature of 125 degrees Fahrenheit for 24 hours on just one filling of ordinary lighter fuel, it is claimed. Vapor from the fluid passes through a heating element, producing the 125-degree temperature without a flame.

Science News Letter, December 31, 1949

PROTECTOR for the bottom edges of trousers is a flat guard-plate which is fastened to the lower edge of the cuff by means of pointed prongs pushed through the cloth to engage a plate within the cuffs. This device, recently patented, can also be used on cuffless trousers.

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HOLDER for cut flowers is made of a sponge-like plastic, is about the size and shape of a cupcake, and has an adhesive base to keep it in position in a bowl. When flowers are jabbed into the sponge, they remain as placed and are kept fresh by water covering the moss-colored holder.

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"FLYING SAUCER" for the youngster, shown in the picture, can be thrown, skipped or boomeranged because the device is so precisely engineered that it actually glides through the air, it is claimed. It is molded of a tough plastic which will withstand rough usage, and it is available in various colors.

Science News Letter, December 31, 1949

CHECKWRITER, small enough to fit into a checkbook or pocket, makes large figures, indelibly perforated and inked into the fiber, showing the exact amount of the check in dollars and cents. Its use insures protection against any check alteration.

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POULTRY-FEEDER, an endless belt type operated by an electric motor and set in motion 16 times during the feeding day by an electric clock, brings grain along its trough-like bottom for a brief eating period and returns left-overs to the bin. Grain from a storage bin is loaded automatically to the feeder.

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PROTECTIVE PLATE, easily attachable to the inside or outside of any door, gives the dog something to scratch when he wants to get in or out without marring the door itself. The plate is made of plastic, and has a corrugated surface which gives off an audible sound when pawed.

Science News Letter, December 31, 1949

ILLUMINATION RECORDER is an instrument that gives a continuous record of outdoor daylight by means of a photocell placed in the open air with unobstructed exposure to the sky. An indoor recorder measures the electrical output from the electric "eye."

Science News Letter, December 31, 1949

Do You Know?

Copper is said to be the oldest metal of commerce.

Calcium chloride, especially prepared for the purpose, is used in treating coal to keep it dustless.

The *area* of the United States is approximately 1,905,000,000 acres, not including sizable rivers and lakes.

The common *female firefly* of the west coastal area is wingless and is seen on the ground, not in the air; the male has wings but is not luminous.

Many *soil maps* of the present time are made from aerial photographs to which are added lines showing soil boundaries and detailed soil information.

Petroleum from Alberta, Canada, will reach the region of the Great Lakes in a quantity of some 100,000 barrels a day by a pipeline now under construction which will be completed in about two years.

SCIENCE NEWS LETTER

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Lift out and insert in binder at beginning of volume.

ERRATA, Vol. 56, Nos. 1-27, July-December, 1949

PAGE	TITLE BEGINS	CORRECTION
3	Heavy Nuclei	Par. 4, lines 10, 11, *read* . . . also there, Dr. Phyllis Freier, and Dr. E. J. Lofgren.
26	Poison Ivy	In subhead and par. 6, line 1, *delete* new.
30	America's Cherubim	Par. 3, line 7, Exodus *for* Genesis.
41	Atomic Scientist Attacks	Par. 5, line 14, Northwestern University *for* president of Central Scientific Company, Chicago.
59	Jupiter Now Prominent	Col. 1, line 10, 17,500 *for* 37,000; line 11, 20,000 *for* 34,000; line 13, 6,000 *for* 16,000.
68	Confirm Opposites	Par. 4, line 2, introvert *for* extravert; line 3, *read* extravert-feeling-intuitive wife.
72	Insects in Baltic Amber	Amber insects considered Oligocene, about 50 million years old.
79	Range of Vision	Par. 1, lines 2, 3, *read* patients who have hemianopsis and cannot.
216	Tungsten Filament	Col. 2, line 8, *delete* American.
265	Bones of Birds	Line 4, *insert after* Los Angeles, Dr. Hildegarde Howard, Los Angeles Co. Museum.
318	Poinsettia Pointers	Col. 3, *delete* last two sentences.
387	Earth's Current	Subhead, line 2, current *for* charge.

GENERAL SCIENCE

Ancients Taught Science As a Writing Exercise

➤ IN 300 B. C. in what is today Iraq the ancient Sumerians taught the sciences of botany, zoology, geography, mineralogy, mathematics, and linguistics. They instructed their youth in these sciences, not because they had technological application, but primarily to teach the difficult art of writing Sumerian script.

The land of Sumer, "was the seat of the predominant civilization in the ancient Near East," Dr. Samuel Noah Kramer of the University of Pennsylvania told the American Association for the Advancement of Science annual meeting.

In order to teach future scribes how to write, he said, the Sumerian "professors" compiled lists of words which students committed to memory, and then reproduced as copying exercises.

These lists were actually classified tables of facts pertaining to the different sciences. These very early classifications of specialized knowledge—actually a form of science textbooks—are "already beginning to prove of no little significance for the history of science," Dr. Kramer said.